Fueling Facility, Above Ground Storage (No.) 713

DEFINITION

Permanently located above ground facilities designed to provide safe storage of on-farm oil products.

PURPOSE

To minimize the risk of accidental release of stored oil products used in agricultural operations to support one or more of the following purposes:

- Control excessive release of organics into groundwater and surface waters
- Control excessive suspended sediment and turbidity into surface water.

CONDITIONS WHERE PRACTICE APPLIES

This practice is applicable to agricultural areas where:

- Oil product storage facilities are used or will be used for agricultural purposes.
- Oil tank storage capacity is not more than 3,300 gallons, in 3 or fewer tanks, at each site and no tank with a capacity that exceeds 1,100 gallons.
- Oil storage capacity is not more than 10,000 gallons on each farm.
- Spillage of liquid would pose a threat to soil contamination; and excessive organics into groundwater and surface water.
- Soils and topography are suitable for construction

On-farm oil products, include diesel fuel, gasoline, lube oil, hydraulic oil, adjuvant oil, crop oil, vegetable oil, or animal fat, as identified by U.S. EPA's Oil Spill, Prevention, Control, and Countermeasure (SPCC) regulation (40 CFR Part 112 Oil Pollution Prevention).

This practice does not apply to the removal of existing tanks.

CRITERIA

General Criteria

Design, construction, and siting shall comply with all Federal, State, local, and tribal laws and regulations. The owner or operator shall be responsible for securing all required permits or approvals and for performing in accordance with such laws and regulations.

Farms with more than 1,320 gallons of oil products stored in above ground containers 55 gallons and larger shall have an SPCC Plan meeting the requirements of the Code of Federal regulations, Title 40, Part 112, Oil Pollution Prevention, prepared and implemented. All facilities required to have an SPCC plan shall have secondary containment for all oil product storage containers 55 gallons and larger.

Michigan Fire Prevention Code, 1941 PA 207, as amended, is the primary Michigan Regulation for aboveground storage tanks. Facilities for farm storage tanks are regulated under Part 3, Chapter 13 of the Storage and Handling of Flammable and Combustible Liquids (FL/CL) Rules, 2003, AACSR29.5201 et seq., promulgated under the authority of Act 207, as amended.

Tanks shall be located on reinforced concrete pads or in dike walled secondary containment where leaks can be detected. The concrete pad or dike walled containment shall extend a minimum distance of two feet beyond the outside dimensions of all tanks in the facility. The minimum distance between storage tanks shall be three feet. The reinforced concrete pad shall extend through the vehicle filling area or a separate concrete pad for fueling shall be constructed. Tanks shall be stably mounted on solid timbers, solid cement blocks, manufactured cradles or equivalent to protect the tank bottom from corrosion due to contact with ground. The

tanks shall be elevated to allow for a visible inspection of all tank surfaces.

Safety

Storage facilities shall be properly marked with signs. A No Smoking sign shall be placed in or near the fueling area. Storage tanks shall be marked as required in the applicable Michigan Administrative Code.

Install automatic shut-off nozzles on all pump discharge hoses.

Storage tanks shall be protected from accidental contact by vehicles, tractors, and other farm equipment. The minimum protection shall be concrete filled 4 inch diameter steel pipes placed at each corner of the storage tank area of the concrete pad. The steel pipes shall be set a minimum of 36 inches into a minimum 15 inch diameter concrete footing. The steel pipes shall be placed a minimum of 6 inches from the edge of the slab.

Provide security measures to limit unauthorized access to the storage tanks and secondary containment structure(s).

Double wall tanks shall have leak detection systems.

Containment

Containment systems, where required, shall be manufactured or fabricated for the purpose of containing oil, fuel, or other regulated liquid. Storage tanks shall be of single compartment design and constructed of steel in accordance with Underwriters Laboratories standards 142.

Secondary containment shall be double walled tanks or dike wall and floor.

The dike wall and floor may be reinforced concrete or steel. Dike walled secondary containments shall:

- Contain 110% of the capacity of the largest storage tank.
- Have a 6 inch depth for freeboard.
- Where the facility is not roofed, have additional storage volume for 6 inches of rainwater accumulation

Containment structures shall have provisions for accumulated rain water removal. Types of water removal systems can be sump and pump or a valve and sealed outlet pipe. All accumulated rain water will be tested for contamination before removal from the containment structure. Testing may consist of verification that no oil sheen is present on the water surface in the dike wall secondary containment.

An area adjacent to the concrete slab for spills to accumulate and be recovered is required. This can be an area where soil or other absorbent material is placed over a concrete slab and upon contamination, material is removed-and replaced.

Location

Section R 29.5337 of the Michigan Administrative Code has a significant list of restrictions on placement of facilities, including a 40 foot separation distance from buildings. The following requirements apply in addition to, or replace those requirements.

The distance between fueling facility sites shall be at least 100 feet.

Site facility or provide surface drainage to prevent the runoff from a 25-year, 24-hour storm from inundating the fueling facility.

The facility floor shall be a minimum of two feet above the seasonal high water table. All field tile (subsurface drains) within 50 feet of a fueling facility shall be removed and capped.

Section 13.1.1(e) of Section R 29.5337 of the Michigan Administrative Code shall be replaced with the following isolation distances between fueling facilities and drinking water wells:

Well Type	Isolation Distance
Private [1/]	150 feet
Public - Type IIB and III [2/]	800 feet
Public - Type I and IIA [2/]	2,000 feet

[1/] As defined by Part 127, 1978 PA 368, Michigan Public Health Code.

[2/] As defined by 1976 PA 399, Michigan Safe Drinking Water Act.

TABLE 1 - CRITERIA FOR OBTAINING A REDUCTION IN THE 800-FOOT ISOLATION DISTANCE BETWEEN FUELING FACILITIES AND EXISTING TYPE IIB AND TYPE III PUBLIC WATER SUPPLY WELLS [1/]	
SUPPLIES WITH A CAPACITY OF LESS THAN 70 GPM *OR* A PROJECTED WITHDRAWAL AVERAGE OF NOT MORE THAN 100,000 GPD FOR ANY 30 CONSECUTIVE DAYS	
Isolation distance reduction allowed down to 400 feet where at least one of the following Protection Factor combinations is documented	Isolation distance reduction allowed down to 200 feet where at least one of the following Protection Factor combinations is documented
A or, B+D or, C+D	A+B or, A+C A+D or, B+C E or, Secondary Containment

[1/] The actual isolation distance should be maximized to the extent possible.

PROTECTION FACTORS (use information from well records, as appropriate).

A - Ground water flow direction is away from well.

B - Confining material of 10 feet of continuous clay or shale or 20 feet of a continuous clay mixture* below the design bottom elevation of the facility.

C - Well casing depth is 100 feet or more.

D - Well pump capacity is 25 gallons per minute or less.

E - Confining material [minimum of 10 feet continuous clay or shale or 20 feet continuous clay mixture* below the design bottom elevation of the facility] + Well casing depth [minimum casing depth of 60 feet] = 100 feet or more.

* Note - For continuous clay mixtures, when interpreting water well record information contained under Formation Description, the first material named is the dominant material in the strata being described. For example: (a) If the material is described as "clay/sand/gravel," clay is the dominant material and would classify as a continuous clay mixture; (b) If the material is described as "sand/clay," it would not be acceptable as a continuous clay mixture since sand is the dominant material.

Deviations from isolation distances authorized through issuance of well construction permits by the Michigan Department of Environmental Quality or local health department may incorporate alternative or additional criteria in accordance with the Michigan Safe Drinking Water Act (1976 PA 399) or Part 127, Water Supply and Sewer Systems, of the Michigan Public Health Code (1978 PA 368).

VARIANCES TO CRITERIA

The NRCS State Conservation Engineer or a non-NRCS professional engineer licensed in the State of Michigan may approve variances to the NRCS standard for isolation distances for Types IIB and III water wells with concurrence from the Michigan Department of Environmental Quality.

Structural Design

Structural design of the concrete pads shall be as follows:

1) Foundation shall be a minimum of 4 inches of compacted, well graded sand or gravel over a native mineral soil or rock or a consistent depth of compacted subbase. The foundation sand or gravel shall have no more than 5% of material pass the #200 sieve and be free of clay lumps.

2) The minimum concrete pad thickness shall be 6 inches. Where vehicles greater than 40,000 pounds gross weight are expected to drive across the pad, a minimum thickness of 8 inches is required.

3) The minimum steel ratio shall be 0.18% in each direction. The maximum steel spacing shall be 18 inches.

4) The reinforcing steel shall be placed at 1 ½ inches clear from the top surface of the concrete.

5) Concrete shall meet the requirements of Michigan Construction Specification MI-158, Reinforced Concrete.

Design and construction of reinforced concrete dike wall containments 4 feet deep or less shall be as follows:

1) Foundation shall be a minimum of 4 inches of compacted, well graded sand or gravel over a native mineral soil or rock or a consistent depth of compacted subbase. The foundation sand or gravel shall have no more than 5% of material pass the #200 sieve and be free of clay lumps.

2) Concrete mix and placement shall meet the requirements of Michigan Construction Specification MI-158, Reinforced Concrete.

3) Concrete floor and walls shall be 8 to 10 inches in thickness.

4) Reinforcing steel shall be #5 bars with a maximum 12 inch spacing located approximately in the middle of the walls and floor.

Design of concrete dike wall containments greater than 4 feet high shall be by the most recent edition of American Concrete Institute Code 350, Environmental Structures.

Steel dike wall containments shall be of a commercial manufacture for the purpose of fuel containment. Steel dike wall containments shall be installed to meet manufacturer's recommendations.

Roofs shall meet the wind and snow load requirements of the Michigan Building Code. Roof structures shall not contain any combustible material. Roofs shall be at least 6 feet above the tank.

CONSIDERATIONS

Evaluate the potential risk to water quality associated with agricultural oil, fuel, and/or liquid storage planned or present on the farm.

Consider using the Tier I Qualified Facility SPCC Plan Template to develop an SPCC Plan where the farm has not had a discharge into waters of the US for the past three years. A link to the template is:

http://www.epa.gov/emergencies/content/spcc/tier1temp.htm

Consider using double wall tanks instead of dike wall containments to reduce cost associated with disposal of contaminated water from within the containment.

Consider the potential effects of installation and operation of fueling facilities on the cultural, archeological, historic, and economic resources.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended use.

Support data documentation requirements are as follows:

- Inventory and evaluation records
  - Assistance notes or special report
- Survey notes, where applicable
  - Design survey
  - Construction layout survey
  - Construction check survey
- Design records
  - Physical data, functional requirements and site constraints, where applicable
  - Soils/subsurface investigation report, where applicable
- Design and quantity calculations
- Construction drawings/specifications with:
  - Location map
  - Designed by" and "Checked by" names or initials
  - Approval signature
  - Job class designation
  - Initials from preconstruction conference
  - As-built notes
- Construction inspection records
  - Assistance notes or separate inspection records
  - Construction approval signature
- Record of any variances and well isolation distance deviations approved, where applicable
- Record of approvals of in-field changes affecting function and/or job class, where applicable.

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be developed for this practice. The O&M plan shall be consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for the design.

REFERENCES

Underwriters Laboratories, Standard No. 142, "Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids"

Environmental Protection Agency, The Spill Prevention, Control, and Countermeasure (SPCC) rule - http://www.epa.gov/emergencies/content/spcc/index.htm